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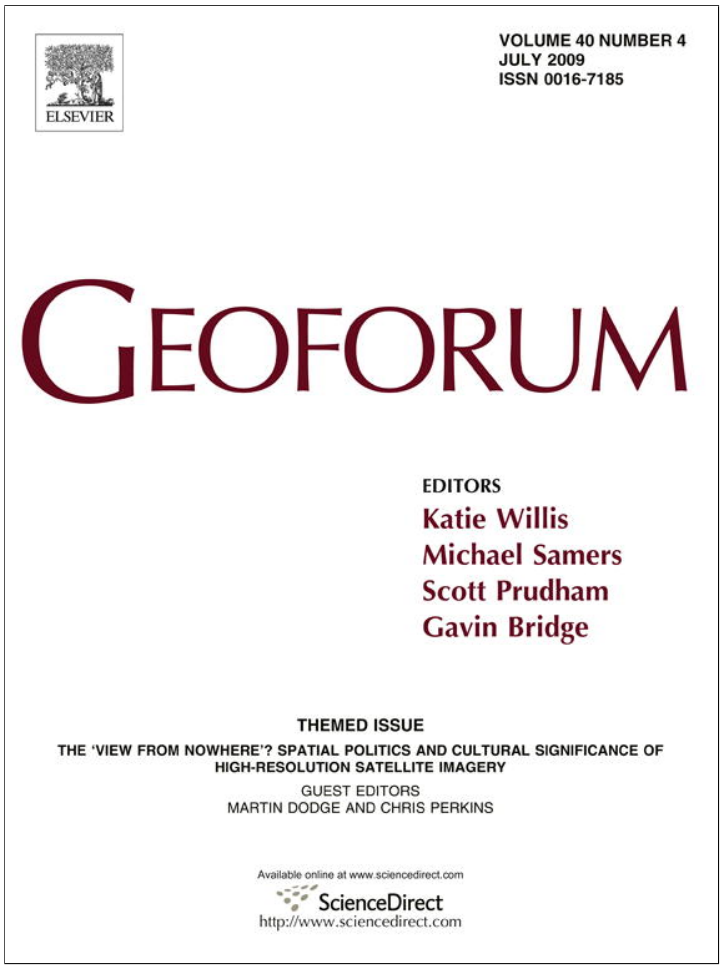

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The co-production of land use and livelihoods change: Implications for development interventions

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ABSTRACT

In a previous paper [McCusker, B., Carr, E.R., 2006. The co-production of livelihoods and land use change: Case studies from South Africa and Ghana. Geoforum 37 (5), 790–804], we argued that land use and livelihoods could best be understood as co-produced, where land use and livelihoods are not separate objects of knowledge related to one another through abstract processes, but different manifestations of social processes through which individuals and groups come to understand the challenges facing their everyday lives, the various resources available to them to negotiate these challenges, and the strategies by which they can conduct that negotiation. In this paper, we examine the theoretical basis for "co-production" with the goal of using this approach to inform development interventions.

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1. Introduction

In a previous paper (McCusker and Carr, 2006), we engaged ongoing discussions about the connection between land use and livelihoods outcomes by arguing that such outcomes could best be understood as co-produced. For us, the co-production of land use and livelihoods rests upon the idea that land use and livelihoods are not separate objects of knowledge related to one another through abstract processes, but different manifestations of social processes through which individuals and groups come to understand the challenges facing their everyday lives, the various resources available to them to negotiate these challenges, and the strategies by which they can conduct that negotiation. In that paper, we left the process of how land use and livelihoods are co-produced at the level of empirical exposition.

In this paper, we examine the theoretical basis for "co-production" with the goal of using this approach to inform development interventions. We feel a theoretical explication is necessary because a co-productionist approach to the connection between land use and livelihoods is a departure from the bulk of work on this subject, especially that which relies upon "driver-feedback" models of causation. A "driving force" is often conceptualized as a process or event external to an object of knowledge, such as a community or a socio-ecological system, that is both necessary and sufficient to explain a change in that object of knowledge. Where other research has focused on various biophysical or socio-economic "drivers" to explain linked land use/livelihoods outcomes, we argue that such research has identified manifestations of social processes that shape linked land use and livelihoods outcomes, not the processes themselves. What is necessary and sufficient for understanding the relationship between changes in land use and livelihoods is an engagement with the relations of power and knowledge in particular places that produce/are produced by both the meanings behind particular economic, ecological or social changes (for example, whether or not they are defined as problems) and the material outcomes that both shape, and are shaped by, those meanings.

In our previous paper, we argued that to understand how change is affected, the central point of analysis must be the identification of who has the capacity to decide whether particular shifts in economy, ecology or society are threats or opportunities, and the discourses through which they apprehend and evaluate these shifts. This opened co-production, as we presented it, to a critical problem – a (mis)reading of discourse as totalizing, creating a land use/livelihoods nexus in which change only comes from outside, stripping local actors of agency. This was not our intent. Instead, we see the co-production of land use and livelihoods change as a specific outcome of more general, constant *effort of individuals and groups in society to rectify the imperfect mapping of discourse and materiality in particular moments, places, and activities.* Simply put, we argue that discourses of both land use and livelihoods, the words, meanings, framings and practices attached to

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each, do not always lead to expected outcomes, or outcomes that can be explained from within that discursive framing. Similarly, the materiality of livelihoods outcomes often fails to live up to expectations, or presents challenges to the discursive framing of those livelihoods. When such events occur, individuals and communities seek to resolve this mismatch by adjusting their discursive expectations of a particular strategy, shifting their land use and livelihoods practices, or a combination of the two. We explicitly avoid the privileging of either discourse or materiality as the lever of change. Therefore, we reject the isolation of a singular, ultimate source of change. Whether intentional or otherwise, both materialist and poststructural approaches hegemonize singular sources of change by seeing either discourse (poststructural) or materiality (materialist) as the "last moment" upon which change rests. We argue that such an approach takes our focus from the *process* of negotiating the tension between discourse and materiality that better reflects the sources of change in linked land use and livelihoods systems.

Through this understanding of change, we attempt to move beyond arguments about the dualities of structure and agency and/or materiality and representation in changing land use and livelihoods toward a focus on the moments in which everyday imperfect mappings between discourse and materiality are exacerbated to the point that actors make efforts to address them. This is not to say that all such imperfect mappings are understood as such. Instead, they become apparent in mismatches between such things as the discursive construction of livelihoods and the outcomes of particular livelihoods activities. While such mismappings may come in the context of external intervention, such interventions cannot be properly seen as "driving" change because they are merely catalysts for complex decision-making. If the impacts of external interventions do not exacerbate imperfect mappings of discourse and materiality in a particular place, these interventions will not result in change. Once such an impact does exacerbate these imperfect mappings, however, individuals and groups will act to resolve this issue, and these efforts are what shape the particular outcomes of such interventions.

In this light, co-production presents significant challenges and opportunities for development interventions, especially those policies intended to foster sustainability or the well-being of agrarian societies. Centrally, understanding land use and livelihoods as two manifestations of the same social relations calls into question the very idea of a development intervention targeted at particular drivers of unwanted or problematic change. If land use and livelihoods are not separate objects of knowledge that operate independently of one another, sectoral interventions are inherently unpredictable and therefore likely ineffective, as any action aimed at reshaping either land use or livelihoods will necessarily reshape the other (as well as a host of other manifestations of these social relations). A strong "rewriting" of either land use or livelihoods via a sectoral intervention will, therefore, likely result in a moment in which land use or livelihoods and the underlying social relations of which they are manifestations are out of joint.[1] The predictability of outcomes tied to interventions which are insensitive to this will be very low. Such disjoints can open up spaces for new or renegotiated social relations that will, in turn, reshape both livelihoods and land use with regard to place- and community-specific considerations. For example, development interventions that do not map to already existing social relations can cause communities to respond with reformulations of social relations that are reactions to undesired external interventions, which might be viewed as a greater challenge than the original problem the intervention was meant to address. Reworking both land use and livelihoods simultaneously cannot resolve this problem, as they are but two of many manifestations of these same social relations.

In this challenge, we see an opportunity. A co-productionist approach to understanding change in (rural) societies is an alternative conceptual basis from which to frame development interventions. As many critics have argued, it is not enough to add social concerns such as gender to development projects "and stir" (e.g. Leach, 1992; Pearson and Jackson, 1998; Jackson, 1998; Rathgeber, 2005). Co-production, in its argument that we must seek to understand local social processes first and *then* integrate our interventions into these processes, validates long-held beliefs that development projects need to incorporate social science expertise much earlier in the project design stage than is common at present.

We begin this article by briefly examining the key bodies of theory that inform our understanding of change in the land use and livelihoods nexus. Following this, we outline how co-production presents opportunities to rethink development policy in a manner that better responds to processes taking place on the ground, and therefore better aligns with the needs and aspirations of those most directly affected by these changes. This is illustrated, in our final section, by two short case studies that illustrate the problems with development interventions that are insufficiently sensitive to the ways in which co-production can be understood as a constant effort to rectify what we see as the imperfect relationship between discourse and materiality.

2. The conceptualization of "co-production"

The idea of co-production emerged as a response to what we perceived as a disjoint between our experiences conducting fieldwork in Ghana (Carr) and South Africa (McCusker) and trends in the land use change literature the livelihoods literature. Our principal concern with these literatures is their shared assumption about the relationship between land use and livelihoods, where changes in one are necessary and sufficient for explaining changes in the other. While studies in both literatures might consider the ways in which feedbacks return to influence the driving side of this relationship, the influence of these feedbacks is generally seen as neither necessary nor sufficient to explain changes in that driver.

This "driver-feedback" model of understanding linked land use change and livelihoods change is buttressed by highly static approaches to social process. Both literatures recognize that changes in the land use/livelihoods relationship are the product of the local social system, in that this system mediates local understandings of and responses to events and processes that transcend the local (such as climate change). However, such mediation often takes place through simplified social categorizations and roles, such as gender, that present such roles and identities as ahistorical and without local constitution (universal). As Carr (2008b) has argued in the context of gender and development, without a consideration of the local constitution of social roles via economic, political, and environmental means, we cannot fully understand how the observed timing and character of particular land use and livelihoods changes come about. In short, without such consideration, we run the risk of conflating disparate processes by only examining their outcomes or appearances.

In response to these problems, we argued for a focus on livelihoods as "not only the circulation of various resources, commonly labeled as forms of 'capital', but also the means by which social roles are constituted and power circulated" (McCusker and Carr, 2006, p. 791). Further, we contended, "land use is reflective of a power-laden ordering of the world, where the appropriate crops, labor, land area, and intensity for a given context are not only agricultural/biophysical facts, but important forms of knowledge that

[1] We thank Ben Wisner for this observation.

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rest upon and produce relations of power in local contexts" (McCusker and Carr, 2006, p. 791). In short, we argued that land use and livelihoods were not distinct objects of knowledge that acted upon one another, but two manifestations of the social processes through which people negotiate challenges to their well-being in their everyday lives.

We therefore, suggest that to understand changes in land use and changes in livelihoods, we must see changes in each as reflexive of changes in the other. Such an approach is a departure from previous efforts to understand this connection, as it shifts causality from processes exclusive to either land use or livelihoods to "the social processes by which individuals and groups negotiate the everyday conditions that shape their lives" (McCusker and Carr, 2006, p. 791). In short, we implicitly located the cause of change in the interplay between the relations of power/knowledge that spring from these social processes and material practice. Therefore, when we argue that land use and livelihoods are reflexive of one another, we are arguing that this reflexivity is a product of the social relations through which agents produce landscapes and livelihoods.

3. Situating co-production

The concept of co-production builds upon empirical evidence collected over 10 years in South Africa and Ghana while drawing on currents in both Marxist and poststructural thought. Our method draws heavily on Harvey's and Ollman's dialectics, emphasizing "processes, flows, and fluxes" over objects and viewing transformative behavior as arising "out the contradictions which attach both to the internal heterogeneity of 'things' and out of the more obvious heterogeneity present within systems" (Harvey, 1996, pp. 49–56; Ollman, 2003). We fully ascribe to a post-Hegelian dialectic that neither constrains us to any dualism nor implies teleology. The limitations of previous geographic employment of dialectics guide us away from the negative, the contradictory, and the thesis–antithesis–synthesis toward engaging dialectics that is "much broader, open-ended, less totalizing, nonteleological, and perhaps more radical" (Sheppard, 2008, p. 2610), a dialectic that allows for multiple, overlapping, and contradictory possibilities.

What we conceptualize as "rural society" or "land uses" or "livelihoods" should not be viewed as static categories and attributed the status of "things" in themselves, isolatable and identifiable as functional parts of a system. Rather, we consider such concepts as temporary stabilizations (moments or forms, where a "moment" is considered a temporal stabilization and a "form" is a spatial one), where we can examine the emergence of imperfect mappings of discourse and materiality that result in change.

A dialectical approach, as we have taken here, holds that the relationships between temporary stabilizations do not exclude their relationships with other processes (moments and forms). Thus, while we specifically examine the relationship between land uses and livelihoods, there are numerous other interactions at play. Our treatment of land and livelihoods (the "co" under examination here) should not infer a privilege towards the dyadic, as is the case in Hegelian dialectics. We see multiple relationships constituting co-produced material-discursive outcomes (plural emphasized). Using the dialectical idea of the vantage point, we approach the co-production of land use and livelihoods through the household (see Ollman, 2003, p. 75). Such an approach does not privilege the household, but employs this social formation as a point of entry to the processes in question. In this approach, the "household" is only temporarily stabilized. We recognize the contested spatial and temporal constitution of the "household", especially in the southern African context. We do this to understand how processes and flows converge on households as they attempt to make decisions about interrelated processes. This also suggests, although we do not have space here to expand, that the concept can be employed at and across multiple scales, actors, places, times, and imaginaries.

For us, holding land use and livelihoods as separate domains of analysis and drawing arrows between them in a conceptual framework is simply a way to begin to understand interaction and change. Drawing on Harvey's emphasis on flows and processes, rather than the "object", and his employment of space–time contingency and the interchangeability of cause and effect, co-production focuses on *where and when* social processes are manifest in land use and livelihood decisions – a nascent step towards a political economy of nature.[2] This is especially important in our research, where limited information about the material is often ameliorated through discursive practices. Word-of-mouth prognostications on topics as diverse as market expectations, government policy, and crop yields often fill the void left by a dearth of empirical information on material practices and their outcomes. Harvey argues that this discursive strategy can only last so long, for while "material practices are not the only leverage for change, but they are the moment upon which all other effects and forces (including those within materialist practices themselves) must converge in order for change to be registered as real (experiential and material) rather than remain as imagined and fictitious" (Harvey, 1996, p. 94).

Here we deviate from Harvey's insights, for we do not see the "leverage" of change as residing, in the last moment, exclusively in either material or discursive practices or outcomes. Generally speaking, we accept the idea that human beings apprehend the material world through discourses, an idea drawn from (among others) the poststructural semiotics of Derrida (1988) and often represented in geography as the claim "there is nothing outside the context" (Dixon and Jones, 2005; Doel, 2005). This idea has been much critiqued through a (mis)reading of this phrase that sees discourse as totalizing, which reduces processes of change to interventions from outside the discourse, and by association outside the actors participating in that discourse. The insistence on materiality as the last moment is an example of a response to this (mis)reading of discourse. We follow Dixon and Jones's (2005, p. 243) (see also Doel, 2005, p. 248) reading of this phrase, where context is "the temporary stabilization of meanings drawn together in the articulation of a discourse that communicates these meanings in a sensible form by establishing differences among them."

It is through this reading of discourse as a temporary stabilization of meanings at a particular place and time, coupled with Ollman's (2003, p. 66) discussion of temporary stabilization in dialectics, that the explanatory power of the co-production thesis emerges. If discourse is only a temporary, spatio-temporally specific stabilization of meaning, there remains the possibility of an imperfect mapping of discourse to the material world, an imperfection we see as inevitable due to the bounded character of subjectivity. No agent can have perfect knowledge of the material world, and therefore, in the course of everyday life, individuals and groups will come upon some phenomena or event that cannot be explained adequately through their existing (discursive) understandings of the world. The imperfect mapping of discourse and materiality is, for us, an engine of change in linked human/environment systems, for when actors become conscious of such a mismapping, such as in the context of a development intervention that reshapes land use and/or livelihoods, they will seek to close the gap between materiality and their discursively-shaped experiences of it. Lest this sound as if all actors are conscious semoticians, we see this recognition of disjoint, and the effort to close it, in such

[2] Phil O'Keefe was instrumental in pointing this out to us.

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things as everyday livelihoods decision-making, such as when particular livelihoods strategies do not result in expected outcomes, leading to changes in land use, livelihoods, or both.

At the crux of the matter here is what we mean by "imperfect mapping". For us "mappings" are the culmination of three social processes, equally semiotic and material: **recognition**, **action**, and **realization**. When formulating a livelihood/land use strategy, individuals or households recognize opportunities to secure a livelihood and act upon that recognition with the objective of realizing their livelihoods goals. Failure to meet these goals, or meeting them in a manner that challenges the discursive understanding of land use and livelihoods on which that strategy is founded, exacerbates the always imperfect mapping of materiality within this discourse. Change, for us, occurs when an agent recognizes this gap and takes action to resolve the imperfect mapping in an effort to better achieve their goals. Ideally, this effort will reduce the mismapping of discourse and materiality to such an extent that the agent feels confident in his or her understanding of the world and how it works.

This elaboration of our reading of discourse and change helps to address the argument that we are evading causality by treating livelihoods and land use changes as reflexive of one another. In fact, we are not simply arguing that land use and livelihoods are reflexive of one another (mutually constituted), but that they are two temporarily stabilized manifestations of the same social processes. Therefore, changes in land use and livelihoods result from (and produce) changes in these processes, which themselves emerge from particular efforts to rectify the imperfect mapping of discourse to materiality in particular places. Causality lies not in a totalizing discourse, nor in a "real" materiality outside of discourse, but in the attempt to rectify this imperfect mapping (the "production" part of co-production). For us, if there is a "last moment" it resides in the tension created by these imperfect mappings. Therefore, we do not see a productive path to understanding these systems through continued arguments for the explanatory primacy of either discourse/representation or materiality alone when explaining particular events in particular places.

4. Co-production and development: policy issues

As many authors (e.g. Katz and Kirby, 1991; Willems-Braun, 1997; Neumann, 2003; Demeritt, 1998) have observed, efforts to define nature often become sites of contestation about particular places and ecologies that have more to do with wider social relations than with the place/ecology in question. Similar observations have been made about capitalism, and even "the economy" (e.g. Gibson-Graham, 2005, 2006). Following this line of thought, we argue that the state of the environment and/or economy is not something "outside" of human beings, but a value-laden object of knowledge that is understood through particular social relations even as it serves as a means of (re)creating those very relations. Changes in the state of the environment and/or the local economy are always and everywhere interpreted through the lens of social relations that shape the definition of such changes as problems or inconsequential events, and therefore the strategies by which individuals and groups address these changes in the state of the environment and/or economy. As is widely held by those working in nature/society studies, it is not enough to measure biophysical change in a particular ecosystem to understand shifts in linked socio-ecological systems. Instead, we must also understand how those experiencing these changes understand them. We argue that such an understanding comes from the exploration of three issues that are simultaneously borne out in both discursive and material practice. First, we must understand who has the authority to assign categories such as "problem" and "opportunity" to particular events or processes. Second, we must ascertain who can identify actions that might be taken to leverage new opportunities and/or minimize the impacts of new challenges. Third, we must find out if and why these definitions and solutions are accepted within a particular group, even as such definition and solution distributes benefits unequally through that group – in short, we must ask why and how inequality persists in a context of change, and how these definitions and solutions contribute to that persistence. This third point is a direct inquiry into the production of nature and economy in contexts of change. Generally speaking, we build upon Smith and O'Keefe (1980) and Smith's (1984) theses on the production of nature by examining how the terms used to define particular changes (for example, problem/challenge vs. opportunity) both shape the justification for given material solutions and, at the same time, speak to existing social relations that are the foundation for the definition of changes as problems or solutions. In this paper, we broaden the application of Smith's ideas from nature to any number of social, economic or ecological challenges that might arise at the nexus of land use and livelihoods (see Carr (2008a) for similar observations in the context of adaptation).

We argue that co-production undermines the fundamental assumption underlying contemporary development practice; that the world is divisible into objects of knowledge that operate independently of one another and therefore can be addressed independently of one another. Co-production, in treating land use and livelihoods as two manifestations of the same social processes, is incommensurable with contemporary development practice. This is not a new call for "an end to development", but instead an effort to present a clear conceptual basis for a development reconstituted in the context of co-production. Such a conceptual basis is what has been missing from much development criticism, limiting its effectiveness in generating policy transformation.

Contemporary development practice rests on the idea that the work is comprised of fixed, bounded objects of knowledge that are somehow universal in that they can be altered in predictable ways through "known packages of effective and generally low-cost interventions" (Sachs and McArthur, 2005, p. 347). Thus, contemporary development work is oriented around the identification of problems and solutions within particular conceptual areas, usually referred to as "sectors". Sectors are assumed to contain the same processes, and therefore be amenable to similar, of not identical, analysis, and intervention. Thus, when one examines the official development documents of different countries facing different challenges, one finds very similar constructions of problems and solutions. For example, both the Second Poverty Reduction Strategy Paper (PRSP) for Ghana (2005) and the Malawi Growth and Development Strategy II (2005) present "good governance" as a major sectoral challenge to human well-being in these countries. To augment good governance, both reports argue for, among other things, the decentralization of governmental functions. There is no discussion in either paper of why decentralization is an appropriate action in either the Ghanaian or the Malawian contexts. Instead, it is assumed that the processes captured by the term governance are the same everywhere, which means that the problems identified with governance in Ghana can be addressed with the same tools as similar problems identified with governance in Malawi.

The repetitive use of these sectors in document after document reifies this particular compartmentalization of the world without any reflexive questioning of this division. Efforts to capture the obvious interplay between processes operating in different sectors (i.e. governance, transportation, population, etc.) attempt to integrate sectoral interventions to build synergies between them while minimizing contradictions and conflicts that might otherwise arise. Such efforts do little to challenge this division of the world. Indeed, the very idea of integrated development reifies these sec-

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tors, as integrated development seeks to bring together self-evidently independent objects of knowledge like economy and environment.

Co-production undermines the basic assumptions underlying this discursive structure, for sectoral interventions are only tenable if land use and livelihoods are objects of knowledge that function independently of one another, and thus can be influenced independently of one another.[3] If, however, land use and livelihoods are but two manifestations of the same social relations, sectoral interventions aimed at either land use or livelihoods are aimed at a symptom of whatever challenge the intervention is meant to address. Because the source of the challenge resides in the local social relations of which land use and livelihoods are manifestations, sectoral interventions will, at best, partially address the underlying issues that are the cause of desired/undesired changes in land use and livelihoods. More often, they can create a situation in which land use and livelihoods come out of joint, where their relationship to local social relations, and therefore to one another, is changed. This shifting relationship is complex and unpredictable, resulting in the "unintended consequences" that have plagued so many development initiatives. Co-production, then, suggests that ongoing problems that arise in the context of development, such as unwanted or unpredictable social, ecological and environmental changes, are not problems resulting from the insufficient integration of these different sectors, but instead the very division of the world into these sectors. It is this division that obscures the cause of both desired and undesirable changes associated with development.

In short, co-production is a conceptual basis from which to call for the localization of development, where problem identification and project design emerge from a careful examination of local social relations. While critical writing on development has, since at least the work of Boserup (1970), critiqued the limited inclusion of broadly social scientific research and insights into a largely economics-dominated world of development, the reality of development practice remains one of projects and practices dominated by (largely neoliberal) economic theories. Certainly, large development institutions have attempted to include anthropologists and geographers in the project design process, and emphasized social issues such as gender equality to the extent that they have become mainstreamed within these institutions (see, for example, the World Bank's Gender and Development Programme, or the UNDP's new Gender Equality Strategy). The practice of development, however, remains one where social scientific insights are generally included after the fact of project design. This "add social science and stir" method of project design limits social scientific insights to the highly constrained context of an already-designed project. As a result, there are few moments in contemporary development practice where (non-economist) social scientists can intervene to fundamentally alter the practice of development. In its worst moments, this pseudo-mainstreaming of social science in development project design may do little more than legitimize the decisions of the political and bureaucratic interests that shape contemporary development practice.

Co-production fills the conceptual gap that has, to this point, limited the efficacy of calls for change in development theory and practice. By reframing our organization of the world from reified, independent objects of knowledge like land use and livelihoods toward connections, flows, and temporary stabilizations of meaning that can be observed at the local level, we identify a clear need for locally-specific examinations of society as the foundation upon which to build needs assessments and development projects. This is not to say that we privilege the local as a site of action, contestation or change in the co-production of land use and livelihoods change. Instead, we see the local as a productive vantage point from which to understand the many, cross-scalar processes and practices that become visible in particular cases of linked land use and livelihoods change. This moves a broadly social scientific perspective from its current marginal position in the development project design process to the center of development theory and practice.

[3] Land use and livelihoods are two objects of knowledge that are addressed in this manner by contemporary development practice. There are many others that are similarly addressed.

5. Two short examples

In order to highlight the theoretical positions we outline above, we present two short examples of how an imperfect mapping of discourse to materiality, when exacerbated by an external intervention, results in linked land use and livelihoods change. We choose these cases because they are the ones that spurred the initial idea of co-production presented in our earlier paper and above. Both cases are focused at the local level, a stabilization of society, environment and economy that is temporary and serves to highlight these processes. In our view, other processes at other scales are at work in each of these cases, but these processes are manifest as interventions that exacerbate locally imperfect mappings of discourse and materiality. The particular efforts to resolve that imperfect mapping are what shape observed outcomes. In our first example, the external intervention is manifest as discursive changes in rights to land access that, when largely unrealized on the ground, affected a disjoint between local discursive understandings of livelihoods and the materiality of limited land access even in the context of new land laws. In our second case, material changes in livelihoods and the local environment exacerbated an different, but still imperfect, mapping between discourses of livelihoods, gender, and household power and the material outcomes of livelihoods strategies.

6. South Africa: access to services, access to development?

During and after the negotiated period of transition from apartheid to democracy in South Africa (1990–1999), the newly liberated government began addressing the vast infrastructural differences between black and white South Africans. A series of policies enabled housing reform, electricity and water provision, and rural "development" via a number of interventions. These policies were designed to facilitate "market-led" development within the state's larger program of neo-liberal reform. As discussed in McCusker and Ramudzuli (2007), South Africa's previously bantustan rural areas experienced rapid land use change from the mid-1990s onward. While the repeal of racially restrictive land laws allowed such changes to occur, the repeal alone is not sufficient to explain the observed changes in land use and livelihoods in these rural areas. We argue that while the state sought to provide policies and services essential to the well-being of those living in the former Bantustans, the discourse around their provision changed expectations about the composition of rural livelihood systems and the resources upon which households depend for those livelihoods, both in areas where people were coming from and the areas that they were going to. These events, then, were catalysts that exacerbated the imperfect mapping between discourses about land use/livelihoods/development and the material experience of those for whom these services and policies were targeted. Specifically, these new policies promoted further change by widening the gap between discourses of development and the material experience of those trying to develop, as they promised seemingly unobtainable services while undermining existing livelihood systems.

Policy formation in post-apartheid South Africa emphasized decentralization of decision-making as part of a larger neo-liberal

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package of reforms. While the formulation of local economic development policy was fraught with contradiction and controversy (see Rogerson, 2006; Ntsebeza, 2006; Bond, 2005), pent-up frustrations caused by years of deprivation under apartheid were unleashed, resulting in a vibrant emancipatory discourse in which local people expected that they would both participate in the definition of "development" and benefit materially from it. Expectations of what the new government would bring, were indeed quite high in the period immediately after 1994. The national-level discourse on transformation informed and was informed by the aspirations of, in our case, rural people who fully expected inclusion in national and local agenda setting. Rural people internalized many of these debates and began to formulate a specific set of expectations to which they worked in order to achieve development. These expectations of development included access to services, employment opportunities, and full inclusion in democratic practices. Livelihoods, rural people expected, would be transformed through contact with this more "modern" and "developed" sector.

To affect transformation, the central government provided a series of much needed investments in infrastructure in rural areas. Housing, water, and electricity provision were amongst the first services extended to previously disadvantaged areas. Many people were, for the first time, able to afford a small, permanent dwelling with electricity and, if not in-house water, a tap nearby. Other people were able to access safe water through the extension of existing pipelines, while even more were connected to the national electricity grid. These efforts were not, in and of themselves, problematic. However, the geography of these interventions remade them as catalysts that exacerbated the imperfect mapping of development-related discourses and material experiences in the affected areas. Specifically, the state provided services in central places first. Due to the extensive nature of settlement in rural areas and their vast underdevelopment, the provision of services to more remote areas took quite a long time, if it occurred at all. For those living in these areas, discursive expectations about development (the expectation of service provision) changed much faster that their material experiences (abject deprivation).

Land use was a key arena in which this exacerbated mismapping played out. Agriculture had long been part of many bantustan dweller's livelihood strategies. While apartheid era policies ensured that Africans in the bantustans would not achieve self-sufficiency through agriculture, it remained an important component of livelihoods. Previously, rural people constructed their discursive and material livelihood strategies around land-based activities, such as agriculture, pastoralism and the production of other natural resource-based goods (see McCusker (2004) and McCusker and Weiner (2003) for examples). As the discursive expectations about development (housing/services) and their material experiences diverged, actors attempted to resolve this mismapping by changing

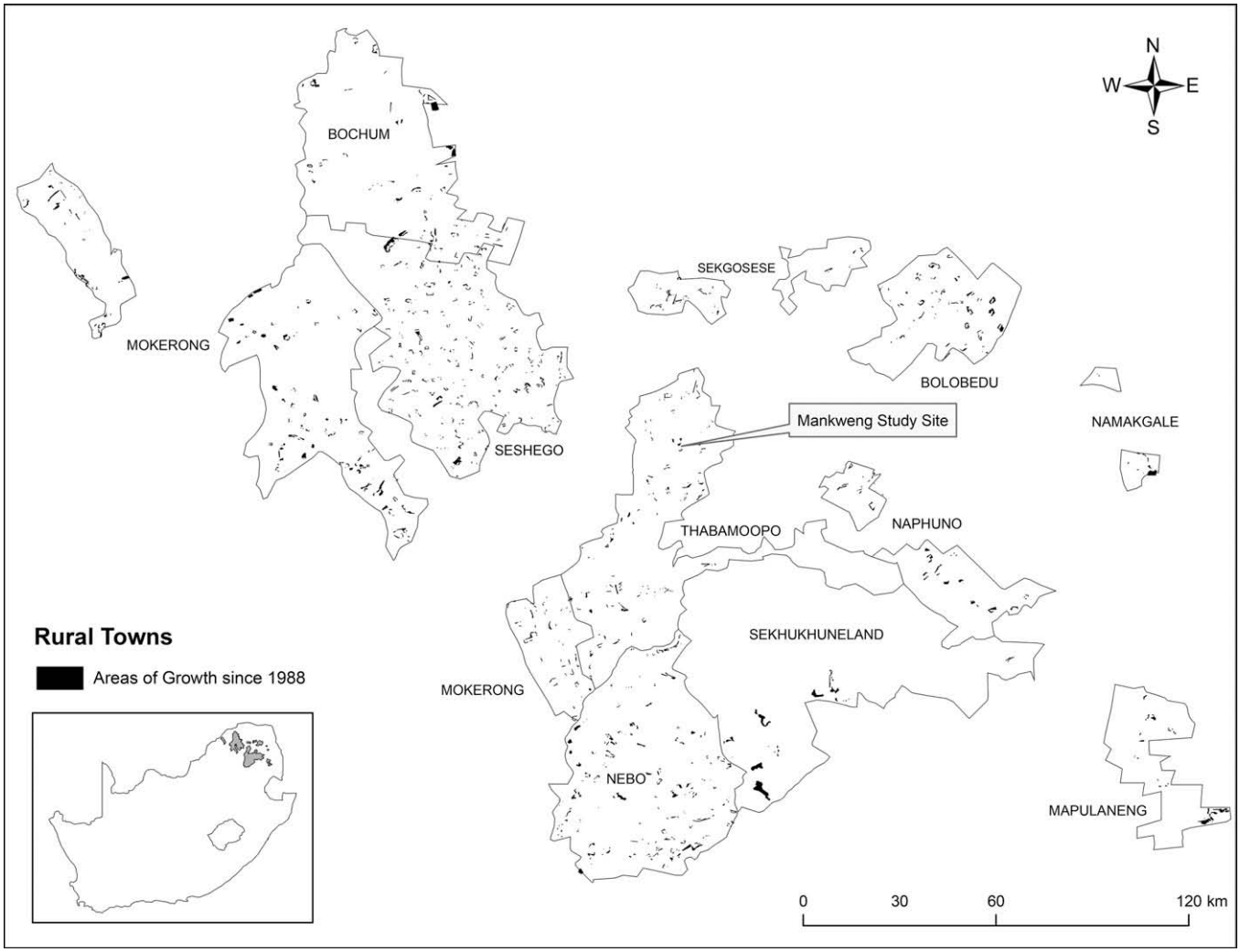

Fig. 1. Peri-urban growth in the former Lebowa bantustan 1988–2000.

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linked land use and livelihoods strategies. For example, actors began to sacrifice a more stable household subsistence mode of production for one based on dependency on state entitlements (which were seen as key to development), thus dramatically narrowing their livelihood strategies. The problem, from the standpoint of rural people, is that their materiality was rooted in a very specific livelihoods geography that was distinct from that promoted through new discursive formations. However inadequate, the old discursive formation around development was land-based. While the new discursive understanding of development shifted land-based activities to the background of livelihoods, the reality of land access issues further challenged this process as available land is largely found in more distant, rural areas of the former Lebowa bantustan. Further, the new discursive formation around "development" privileges access to services, which were being provided largely in towns. The solution to the imperfect mapping was spatial – people moved (see Fig. 1).

In central Limpopo, land use change has been most rapid near existing townships in the former bantustans and is evidenced by rapid growth of peri-urban settlements (McCusker and Ramudzuli, 2007). Our argument is that change occurs in land use and livelihood systems as agents within that system consciously or unconsciously attempt to resolve differences between discourses of "appropriate" and/or "productive" land uses and livelihoods vis-à-vis "development" and the material outcomes of the practices enabled and legitimized by these discourses. The new service-based discursive understanding of development led people to leave their land and migrate to peri-urban settings, where the principal opportunities for employment are in the non-farm labor market. Problematically, no sector currently exists in South Africa that can absorb the stunning rate of unemployment in rural areas. However, migration into a problematic market is not an illogical act, or one undertaken with imperfect information. Instead, it is a highly logical decision made by actors with reference to a perceived mismapping of their discursive understanding of development and its material outcomes (see Fig. 2).

To illustrate the internalization of this new development discourse, and the importance of efforts to resolve the imperfect mapping of discourse and materiality in this context we focus on the town of Mankweng and draw on data collected by McCusker and Ramudzuli (2007) for a study on peri-urbanization. In that study, the authors analyzed land use change in the period 1963–2001 and conducted 184 randomly selected household surveys. The surveys were conducted in the local language by enumerators from the local area.

In analyzing the reasons given for relocating, households in the study area acknowledged that they relocated to peri-urban settlements knowing that their livelihoods would be adversely affected in the short term. We were struck by the depth of material deprivation people were willing to tolerate in order to gain access to

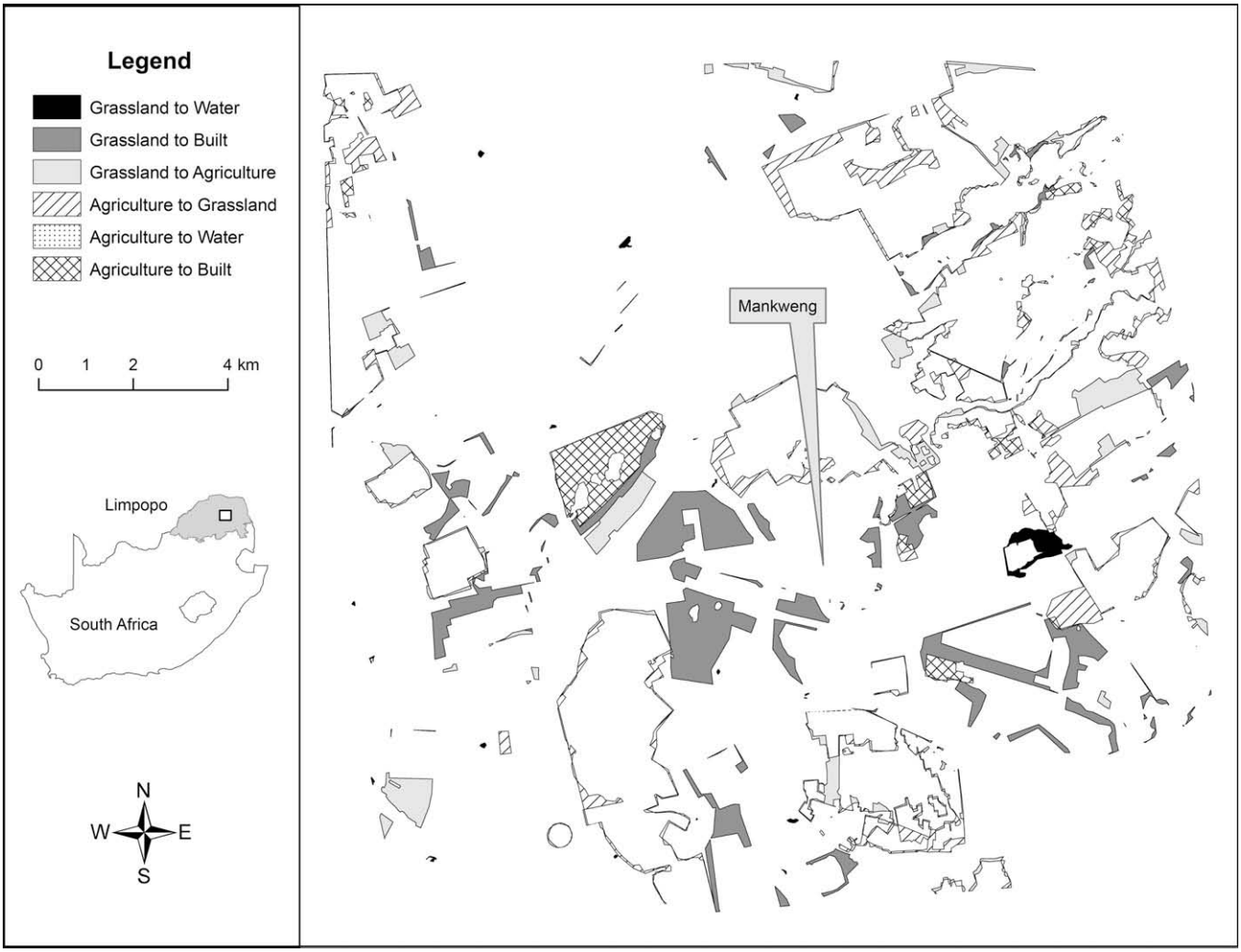

Fig. 2. Land use and land cover change in and near Mankweng, South Africa 1993–1997.

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"essential" services. Nearly 64% of respondents are unemployed with a yearly annual income of between R1000 and R10,000 ($US 150–1500 at the time of the research). Study participants complained about a "lack of development" and "isolation" in the deeper rural villages from whence they had come, although they acknowledged that they had access to more land in the villages. They argued that services and proximity to towns were an "essential" part of life, while at the same time acknowledging that their livelihood systems suffered often severe stress as a result of their relocation to peri-urban settlements (dependency on state support programs is high). Rural people are both affected by and affect discourse on "development" in these areas. They feel pressure to relocate when they hear tales of relatives who have been successful in the towns or when they sense their "town" relatives look down on them for their "rural ways". These discursive engagements are entwined in complex rural power/knowledge regimes where pressure builds on people to follow the family or to relocate at the behest of a traditional authority, where town life is portrayed as more "modern" and sophisticated, whilst people in rural areas are "backward" and "unproductive". In effect, convincing a relative to move to town affords the town dweller a greater sense of security as claims on familial labor and monetary resources are easier to call upon. Many older residents, for instance, face enormous pressure to move to growing towns from areas where they still practice small scale subsistence agriculture from children who wish to access the elderly relative's pension grant. A strong discursive shift is not sufficient to effect change, however. The provision of services in central places has enticed people to the towns in large numbers. Distant rural areas are often last to receive such services due to expense and/or inaccessibility. Thus, after rural development programs began in central places such as Mankweng, people from deep rural areas flocked to the towns in an attempt to resolve the disjoint, or imperfect mapping, between their livelihood and land use practices and the discourse on "development". For many, there was no guarantee of any livelihood at all in the towns beyond a few relatives who claimed state pensions, and later, child grants. In this case, then, attempts to rectify imperfect mappings via the co-production of land use and livelihoods has resulted in new geographies of poverty. Co-production is not a road map to success, rather an exposition of the social processes behind *both* successful and unsuccessful survival strategies.

The movement of people from the rural areas to peri-urban settings is neither illogical or the product of imperfect or flawed information. People are materially insecure in rural areas move to towns to narrow the gap between what they understand discursively as a good way of life and what they experience materially. They relocate to access services that have been discursively constructed as "needed" and in return they eventually lose access to the small landholdings, and its agricultural produce, they had in rural areas. This is not to say that we suggest rural people do not need services such as housing, electricity, and water. Rather we suggest that the discourse on need for such objects of development may lead people to understand moving as a good idea, *even if this is not immediately borne out materially*. This is not an attempt to privilege discourse over materiality, but a recognition that people are trying to close the gap between what they *perceive* discursively and *experience* materially as development. Change in Mankweng and surrounding areas is, then, the result of an attempt by households to rectify this gap. "Development" becomes water, electricity, and access to shops as rural people internalize development debates about the essential nature of such services. Agriculture becomes "old ways" and "things that old people do".

Policy, in this case, has intervened in land-livelihood systems with the effects of (a) exacerbating a disjoint between land use/livelihoods and discursive formations around "development", (b) increasing livelihood vulnerability by narrowing the number of strategies that people rely upon to exist, and (c) concentrating people into increasingly unmanageable peri-urban settlements. The spatial pattern of service distribution creates a situation in which movement is a plausible solution for a perceived gap between what they discursively perceive as development and what they feel they must obtain materially to be considered developed. The problem is that such policies are promoting a wider gap between discourse and materiality, as there simply are not enough viable livelihood opportunities in the towns to support the influx of people. The more the discourse on development promotes ideals such as permanent houses, access to water, and electricity as models of development without providing livelihoods opportunities, the larger the gap will grow and the more people will need to rectify the gap, thus promoting more and more change in land use and further instability in livelihoods.

6.1. Ghana: unintended intervention

The following case study captures the complex changes created by a disjoint between the land use/livelihoods nexus and its underlying social relations in the context of an "inadvertent intervention", the restructuring of local transportation that resulted from an economic shock to the national economy of Ghana. As such, it demonstrates how sectoral interventions aimed at either land use or livelihoods treat only a symptom of the processes that shape these outcomes, and can trigger complex local responses that are difficult to predict and manage. In this case, a complex set of migration outcomes is the direct product of household-level decisions about how to bring land use and livelihoods back into alignment with household power relations after this shock.

In the villages of Dominase and Ponkrum, located in Ghana's Central Region (Fig. 3), households have addressed endemic economic and environment uncertainty in their land use and livelihoods strategies for more than 50 years. The challenges they have faced include shifting agroecologies as new cash crops and hybrid varieties have been introduced to local farms by colonial and governmental interventions (Carr, 2001), uncertain and shifting access to non-farm employment (NFE) (Carr, 2002a,b, 2005b), and the steady degradation of local soils brought on by shifting regional precipitation patterns (Solomon et al., 2007; Waylen and Owusu, 2007) and the loss of tree cover in the area (see Gyesi et al., 1995).

Despite these shifting challenges, residents of these villages have, over the past 50 years, managed to maintain their livelihoods through one of two strategies (for discussion of the history of livelihoods in these villages, see Carr, 2001, 2002a,b, 2005b). The first of these is a strategy that spreads household agricultural production across market sale and subsistence consumption, where men focus on market production and women on subsistence production. In households employing this "diversified strategy", both men and women take up non-farm employment, earning approximately 35% of their total reported[4] incomes through these efforts. In these households, women's total reported income is about 88% of that earned by their husbands. The other strategy is a market-oriented strategy where all producers in the household aim to sell their

[4] All income figures in the text represent the income reported by the respondents, converted into US dollars using exchange rates for the time when data was gathered. The value of subsistence production or household labor are not included in these income figures. Respondents were unable to provide such information and data does not yet exist that allows for the rough equation of hectares to value for particular crops. While this limitation of the data clearly undervalues women's economic production, especially in the diversified households, it accurately represents their economic position within their households and in society. Subsistence production and household labor are not compensated in these villages. As a result, subsistence production and household labor do not provide a reliable basis for challenging the power relations that shape land use and livelihoods in these villages.

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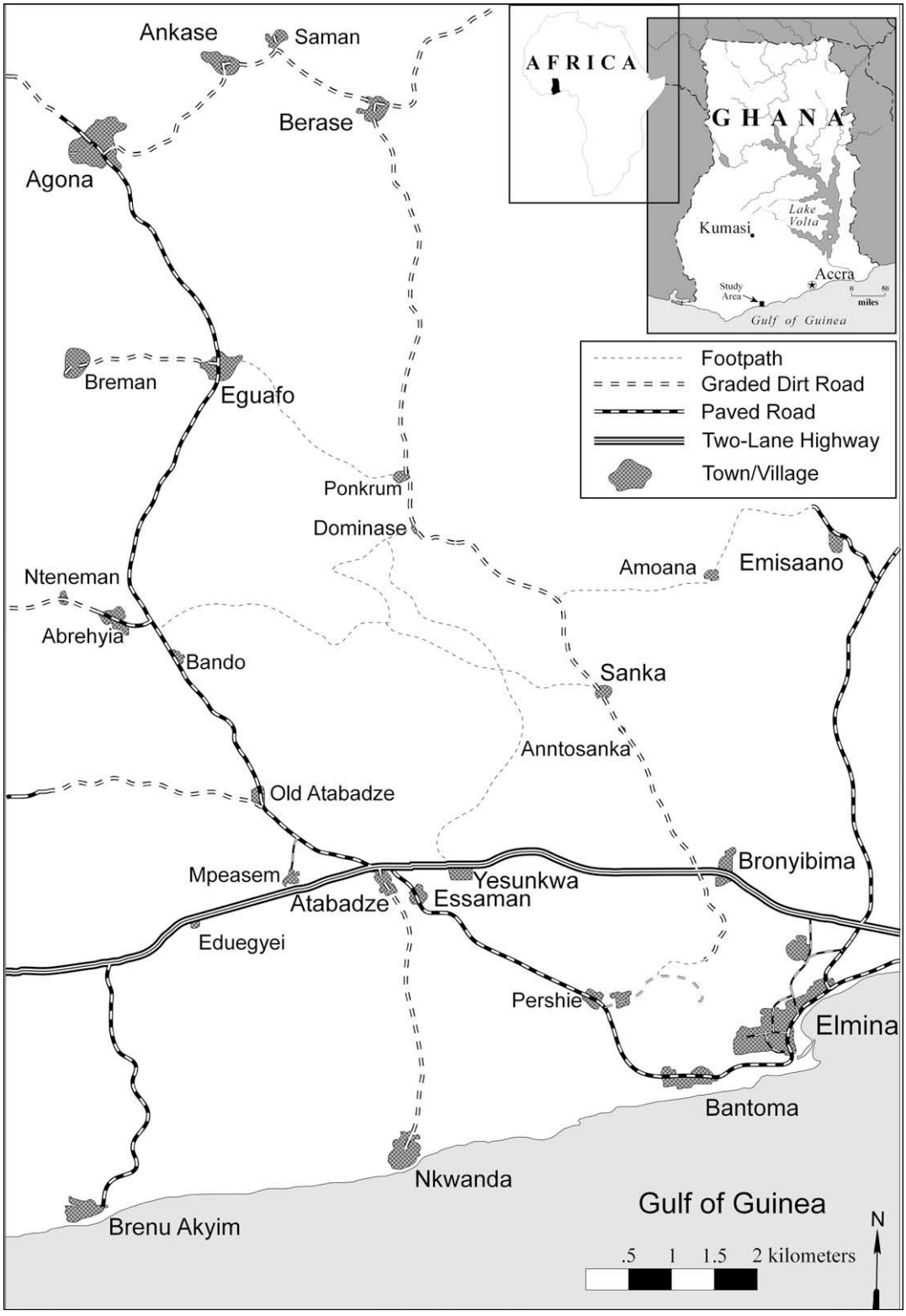

Fig. 3. Locator map of Dominase and Ponkrum.

crops at market. Both men and women in these "market" households take up NFE, typically earning roughly 40% of their total incomes through such work. Women in these households report earnings that are approximately 25% that of their husbands.

On the whole, "market" households have been much better off than "diversified" households. Market households farm slightly less than 4 ha/year, while diversified households farm 3 ha/year. Men in market households currently report earnings of nearly $950 annually, while women report more than $220. In diversified households, men report earnings of about $170, and women about $150. The differences in income between the members of these households are the product of more than access to land. They are also the result of different land uses, as the members of these different households plant different crops in different quantities.

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Some of the most lucrative crops in Dominase and Ponkrum are tree crops. Men in market households are heavily focused on such crops. One hundred percent of the men in these households raise acacia (*Acacia Polyacantha*, a dryland tree used for charcoal), 90% raise oil palm (*Arecaceae Elaeis*), and 60% raise coconut and/or oranges. While men in diversified households also raise tree crops, they do so in smaller numbers. Seventy-five percent of these men raise acacia, 80% raise palm, 40% raise oranges, and 25% coconut. In both household types, women raise practically none of these. The greater emphasis on tree crops in market households than in diversified households means a somewhat greater focus on permanent cultivation, which takes land out of the general communal[5] structure that governs landholding in this area. Perhaps more importantly, though, in both household types this land use issue suggests that women have very little access to land for permanent cultivation, and therefore no means of obtaining the economic security that comes from such crops.

These closely intertwined land use and livelihoods outcomes, differential across households and genders, are not surprising if we view them as two manifestations of larger social processes, in this case gender roles and household power relations, in these villages. As discussed elsewhere (Carr, 2005a, 2008a,b), the two dominant land use and livelihoods strategies in these villages are organized with two goals in mind. First, they are efforts to maintain the material well-being of the household. The diversified strategy mixes market and subsistence production to guard against shocks to either the local/regional economy or the local environment that might compromise subsistence food supplies. The market strategy focuses on earning as much money as possible to secure any resources needed to weather an economic or environmental shock. To this first end, both strategies are fairly successful. While malnourishment and access to goods such as oil lamps or flashlights (there are no public utilities in these villages) may, at times, become problematic, there are few cases of outright deprivation in these villages, and starvation is unheard of. Given their limited incomes, slender resources and dependence on the natural environment (via rain-fed agriculture) for the majority of their livelihoods, this baseline material outcome is remarkable.

These strategies, however, do not produce maximized material outcomes. For example, it has been noted elsewhere (Carr, 2008a) that the diversified strategy appears to over-constrain women's production, thereby limiting women's incomes and, by association, the resources available to the household. These "sub-maximal" outcomes are not accidental, nor are they the product of imperfect local knowledge of the environment and economy. Instead, they reflect the convergence of gender roles and power relations in the households of these villages. Both strategies draw upon existing, naturalized gender roles. In these villages, women are cast as those with primary responsibility for the reproduction of the household, while men are treated as having the right to contribute to the household as they see fit – roles that are reflected in everything from patterns of spending and consumption to the different crops that men and women emphasize on their farms (Carr, 2008b).

Each household strategy extends these gender roles into the arena of agricultural production and economic activity. Men choose to limit their wives' production to ensure they continue to play this gendered role, even though doing so comes at a material cost to the household, because such limitations serve to reinforce women's dependence on men and their incomes. In short, land use and livelihoods in Dominase and Ponkrum are produced by/productive of underlying social relations of gender in these households that privilege men, who are the principal decision-makers with regard to land allocation and household consumption decisions.

While these strategies have proven to be remarkably durable, they have not been able to manage every challenge that has come to Dominase and Ponkrum. In the late 1960s, world prices for timber crashed, triggering a collapse of the Ghanaian timber industry (Huq, 1989). This came home to Dominase and Ponkrum in two forms. First, a local logging operation, centered five kilometers to the north in Berase, ended its operations. This closed out a local source of NFE employment, either as labor for the cutting of trees, or in ancillary positions such as road maintenance. Further, as the logging operation had constructed and maintained the road network that linked Dominase and Ponkrum to nearby urban areas, when the logging stopped, the roads fell into disrepair and rapidly became impassable. Where once residents of these villages could easily secure transport to jobs in the nearby towns of Elmina and Cape Coast, they were now faced with a 3–5 km walk to the nearest source of transportation to these towns. Therefore, access to regional NFE also fell off. Pushed back onto their farms for their livelihoods, a trend toward long-term, gradual degradation of the local environment became apparent. Residents complained (and still complain) of declining farm output related to decreased precipitation and loss of shade from tree cover. Where before such a gradual decline in outputs could be tolerated and compensated for through NFE, in the new context of these villages there was no means by which to offset this decline. The livelihoods of those living in these villages were greatly compromised.

The response to these interlocking shocks defies simple interpretation as an effort to manage the material impacts of these events and preserve the well being of those living in these villages. Between 1970 and 1980, 35 households moved out of these villages. Most of these moved to peri-urban settlements near reliable transportation and where they could gain access to land for farming. While this initial response might be interpreted as an effort to reestablish connections to the livelihoods resources necessary to ensure the reproduction of the household, to do so is to ignore the 67% of households that did not move from these villages in the first decade after these shocks. However, the remaining households did not all stay indefinitely. In the 1980s, 17 more households (16% of the 1970 total) left the area, following the first wave of migrants to peri-urban settlements. In the early 1990s, another 17 households (16% of the 1970 total) left the villages. Of the households moving in the 1980s and 1990s, most were female-headed, and they moved soon after the death of the male head of household. The complexity of this migration, in terms of timing and demography, suggests that the changes in livelihoods in Dominase and Ponkrum were not themselves the cause of migration decisions. Instead, they appear to be a contributing factor in this decision-making process.

We argue that examining this migration through the lens of co-production makes this complex migration intelligible. Rather than cast the economic and environmental changes in the area as challenges to the material well-being of households in these villages that drove this migration, a co-production approach suggests that we examine how these changes created a set of livelihoods outcomes that no longer mapped to local discursive understandings of livelihoods. When OFE disappeared from the household economies of these villages, it took about 40% of total household income from them. But this loss was not distributed evenly within these households. In diversified households, the loss of NFE cost women as much as 60% of their annual incomes. Men lost comparatively

[5] By communal, we mean that these residents follow Akan land tenure practices in which the male head of household acquires land from his clan for the entire household on an annual basis. This land is then allocated by the male head to members of his household. The household uses this land for 1 or 2 years, but once it is returned to fallow, it becomes part of the general pool of land controlled by the clan (Egyir, 1998; see also Quisumbing et al., 1999, 2001; Brydon, 1987; Awusabo-Asare, 1990).

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little, approximately 10%. Therefore, the cost to men of these changes was relatively small, while women's abilities to meet the needs of the household were heavily stressed. In market households, men lost about 40% of their income, while women lost 46% of theirs. While women's loss of income was significant and likely placed them under similar stresses as those seen in diversified households, it is men's loss of income that is significant here. While they still earned much more than their wives, these men saw their contributions to the household greatly diminished, and with that change they likely lost some of their authority in the household, predicated as it was on their ability to supply the household with needed income if and when they chose.

Thus, the shock to the livelihoods system of the area had a differential impact across and within households. In market households, the loss of NFE may not have been crippling (even without NFE, these households earned nearly three times as much as the diversified households), but it did fundamentally challenge the idea of earning as much money as possible to manage shocks. This is especially true for women, who in losing nearly half of their income certainly noticed a much greater stress on their ability to provide for their households. For women, at least, this created a disjoint between their discursive understanding of livelihoods strategy and their material experience of its outcomes, which may have led them to question this livelihoods discourse, and their place in it. Challenges to this discourse, which exists in a mutually-reinforcing relationship with gender roles in these households (Carr, 2005a, 2008a,b), would certainly have become a threat to men's authority. To remedy this problem, men decided to move to new settings where their households could regain access to NFE and re-legitimize both household gender roles and power relations. These were the households that moved first, and moved with great regularity to sites either near NFE opportunity, or with reliable transportation links to places with such opportunity. This migration, then, can be explained as an effort to rectify an imperfect mapping of the discourse of livelihoods strategy in these households with the material experience of the outcomes of that strategy.

In diversified households, the loss of NFE did little to undermine men's incomes or the discursive understanding of a need for both market and subsistence production to manage risk. Further, it diminished women's incomes, placing them in a position of greater reliance on their husbands for their own and their children's survival. In these households, then, the material impacts of the loss of NFE did not put land use and livelihoods out of joint with the discursive understandings of gender roles and power relations in the household. These households, then, are the ones that did not move, for men were able to maintain their authority despite the change in material circumstances. This also explains the drawn out character of the migration from Dominase and Ponkrum. Those female-headed households that left the area were not necessarily forced from the land when the male head died, but instead, in the absence of a male head of family making decisions for his own benefit, made their own decisions about what would be best for their interests and moved to locations that provided the women with greater material opportunities.

7. Conclusion

We have argued in this paper that change in livelihoods and land uses arises when imperfect mappings of discourse and materiality become apparent to people as they struggle to maintain a living in a constantly changing world, and they act to resolve this imperfect mapping. This concept illuminates the causes of change at a level of abstraction below what are commonly referred to as "driving forces". While we see value in identifying such forces, our approach deepens the analysis of the linked causes of land use and livelihood changes to show the processes by which these forces, and other, often everyday events, are incorporated into highly local decisions that produce observed changes. At no point did we advocate *replacing* a modeling approach with a co-productionist one, rather we argue that they are complementary.

The case studies illustrate how co-production moves us past sectoral, simplistic understandings of land use and livelihoods change in the context of development. The development literature is littered with cases like those presented here, where the impacts of sectoral interventions are not confined to their object of knowledge. Land reform laws, for instance, come to affect not just land uses, but also livelihoods decisions and even spatial decision-making. Economic shifts and shocks, such as those associated with the opening of economies in the Global South, do not just change people's livelihoods opportunities and land use choices, but can shake societies to the level of the household and gender relations. In short, we already knew that sectoral interventions do not drive development in a simple, linear manner.

Co-production moves us from the critique of this mode of development toward a reconstruction of development around scalable social scientific research. By actively theorizing the processes of change in land use and livelihoods as the outcome of responses to perceptions of imperfect mappings of discursive understandings of land uses and livelihoods strategies and their material outcomes, we enable the explanation of events that, from the standpoint of sectoral development, appear unpredictable, lamentable, but in the end inevitable. Contemporary development practice often represents development outcomes in these terms because the sorts of interventions producing such outcomes are aimed at the symptoms of local processes of change, rather than the processes themselves. Co-production demonstrates that this problem is not inevitable, but the product of a particular parsing of the world that does not, in the end, reflect processes on the ground. Quite simply, our examination of these cases via co-production demonstrates that there can be little effective development planning without the kinds of careful, detailed work on particular contexts that social scientists have been conducting for decades. Further, this work cannot be tacked on to the end of current project designs, as is so commonly done today. Understanding particular contexts, and how they might be catalyzed by a particular intervention, must lead the way in project design.

Co-production is therefore a foundation for arguments supporting a locally-sensitized form of development. Further, it is a counter-narrative to the ideas of economic rationality and universality that guide much development planning and practice today. The complex and often unintended outcomes of development interventions often appear unintelligible because of a development lens that expects consistent responses to known stimuli across contexts. What we have demonstrated here is that while local actors are, in most cases, rational (within their own contexts), they are not simply responding to drivers of change. None of the sectoral interventions described here are, by themselves, sufficient to explain observed outcomes. This is not because these outcomes are inexplicable, but because a development lens focused on universalizable stimulus–response relationships between drivers and change does not consider the "constitutive processes of meaning/materiality that are negotiated through power relations and social processes" in particular places (McCusker and Carr, 2006, p. 792). By breaking co-production down to the level of internal mechanics, the imperfect mapping of discourse and materiality and efforts to resolve that imperfection, we hope to provide enough specificity to allow others to follow the approach we have outlined above, and contribute to the shaping of this new development.

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